

# IM Monthly Report



## Mississippi Public Service Commission Kemper IGCC Project

September, 2016

### URS

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## Executive Summary

URS Corporation (URS), later acquired by AECOM, was requested by the Mississippi Public Service Commission (MPSC) to provide Independent Monitoring services for the Kemper Integrated Gasification Combined Cycle (IGCC) Project located in Kemper County, MS. The scope of services includes monthly reporting by URS (AECOM) and its subcontractors, the Independent Monitor (IM), of the status and prudence of the on-going engineering, procurement, construction and startup activities performed by Mississippi Power Company (MPC or the Company), its parent Southern Company and subsidiary Southern Company Services (SCS), and its subcontractors on the project. This IM Monthly Report provides the results of this assessment for the reporting period of September, 2016, and review of the project status reported by MPC for the period from July, 2016 to September, 2016 (EPC Status Production Meeting Reports August 24 and September 22, 2016, July and August 2016 PSC Reports, and Kemper County IGCC Weekly Executive Summary, Metrics and Control Meeting Reports through October 4, 2016).

During this reporting period, the IM has conducted weekly status review meetings with MPSC staff. Several meetings, teleconferences and reviews were also conducted with MPC and SCS staff, as described below (refer to other Report Sections where referenced for more details):

- September, 2016 – Accounting audit of financial records from end of June, 2016 through end of July, 2016 held at MPC offices in Gulfport, MS (Appendix C).
- September, 2016 – Daily monitoring of on-going site construction and startup activities at the jobsite (Appendix E).
- Week of September 12, 2016 – Review of gasifier startup activities held at the jobsite (Section 1.10).
- September 12 and 13, 2016 – Review of project EPC status held at the jobsite (Appendix D).
- September 28, 2016 – Update from MPC on status of open RFI's (Appendix B).

### Project Status through August, 2016 (Unless Noted Otherwise)

Engineering - The gasification island design performed by KBR, and the SCS design of the combined cycle island and the balance of plant (BOP) work, is 100% complete for base scope. All major Revision 0 design packages have been issued for construction. Remaining effort will be focused on resource pool and scope addition activities, including:

- Resource pool support activities.
- Support to construction on heat trace contract.
- E&CS and MPC Management of Change (MOC) process support.
- Design revisions from PHA, support requests, updated vendor information, and scope additions.
- Addressing PSSR functional turnover punchlist items.
- Beginning activities to support Project Close-Out.

Procurement - All major equipment and commodity orders have been placed. Major equipment deliveries are complete. Remaining effort will be focused on final construction and startup needs including procurement of miscellaneous items as identified (scope additions). During September, there were three new awards issued for ultrasonic flow meters, one gate valve, and pin assemblies for ash conditioners. One vendor recommendation was approved in September for hydro-blasting and vacuum truck services.

Construction (through September 25, 2016) – Plant construction is complete for the combined cycle unit, nitrogen plant, water plant, water storage pond, ash storage, buildings, lignite delivery facilities, piling and caissons, underground utilities, mass grading, concrete, structural steel, equipment, piping, instrumentation, cable tray, cable, terminations, conduit, tubing, and heat tracing. Plant work in progress includes equipment insulation (98% complete, about 13,000 SF remaining), and pipe insulation (98% complete, about 19,000 LF remaining), plus ongoing punchlist and scope addition activities. Overall base plant construction remained at 99% complete (through August, 2016).

Transmission – Right of way acquisition and construction is complete for all 11 line segments and all 8 substations. MPC will continue to monitor transmission right of ways for any needed restoration and maintenance.

Pipelines – Right of way acquisition and construction is complete for all 3 pipelines. Long term sales or supply contracts have been signed with the City of Meridian (water supply), Tennessee Gas Pipeline (NG supply), Denbury Resources (CO<sub>2</sub> sales), Air Liquide (nitrogen supply from onsite Air Separation Unit), and Martin Product Sales (sulfuric acid and ammonia sales by truck). The CO<sub>2</sub> contract provides for termination by Denbury at its discretion if CO<sub>2</sub> deliveries do not occur by July 1, 2017.

Liberty Mine - Current land control is 100% complete for the initial five year permit area. Construction activities are complete. Mine is operating and stockpiling lignite. Total actual spending for the mine development through August, 2016, including mine Allowance for Funds Used during Construction (AFUDC), was unchanged at \$232.0M, which is the forecast final cost.

### **Mississippi Economic Impact**

IM has reported for each contract and purchase order whether MS bidders were involved, and if so, status and basis of the award decision (refer to Appendix F). Through August, 2016, contracts totaling \$2.122 billion have been awarded to MS companies, and total MS spending is \$2.106 billion (about 30% of the total, including uncapped costs). MS workforce contributed 346 construction jobs and 362 plant/mine jobs in August. A total of 563 MS Companies have provided construction, equipment, material or professional services for the Project.

### **Key Concerns**

The following Project Execution related concerns have been reported with associated resolution status:

- Differential settlement and/or slope movement during initial loading of lignite stockpile in the storage dome - *Survey benchmarks will be monitored for settlement and slope stability during initial stockpile placement. IM suggests MPC consider development of mitigation plans in the event excessive settlements and/or slope movements are discovered, and staging of the initial placement of the lignite stockpile.*
- System testing has discovered numerous pressure leaks due primarily to inadequate installation, quality control, and quality assurance of flanged and welded connections (bolt torquing, gaskets, seals, pipe alignment, missing or inadequate welds) – *MPC is repairing the leaks when identified. Key concerns are noted below:*
  - Syngas cooler leaks – *leak repairs and hydrotest completed on both Trains; IM has concerns with future leaks under operating conditions.*
  - Particulate Control Devices – *leakage of low amounts of particulate coal fines (1 to 2 lb's/hr) was detected in the upper section of one of the two PCD's in train B due to cracked condulet for the thermocouple; awaiting clearance to complete repairs.*
  - Pump seal leaks - *seals on all the pumps in the 140 and 210 areas have been changed out due to the seals leaking; vendor is working with the plant to resolve this issue.*
- Train 2 venturi scrubber pumps cavitation issues – *continue to be evaluated during the lignite feed tests.*
- Venturi scrubber solids carryover issues – *new duplex strainers will be installed on all 6 trains; steel platforms and piping in progress; strainers will be installed after other work is complete; approximate duration will be one month per train to complete.*
- Recovered water filters plugging – *testing the new set of filter elements in the 3 Recovered Water Candle Filters is being monitored during the limited lignite runs; better results but these three filters will not be able to handle the flow from 6 trains; engineering is looking into this.*
- Gasifier refractory repairs – *initial refractory repairs, dry out and refractory cure were completed in both Gasifier A and B; additional repairs were required on Gasifier B after initial syngas production was stopped (see below).*
- Plugging issues at the roll crushers - *new sealed bearings have been installed in all six gear boxes; new 7 blade feeders will replace the existing 8 blade feeders in the roll crusher rotary inlet air locks.*
- Ash moisturizer system – *modifications on all 4 ash moisturizers have improved operation; ash removal through the A and B Ash Moisturizers continues without any mechanical issues noted; these systems continue to be monitored.*
- Lignite dryer solids accumulation – *material testing and evaluation in progress.*
- Bridging in the coal feed lock vessels on Trains 4, 5, and 6 – *Train 4 lock vessel is being prepared for testing; software and nozzle modifications continue on trains 5 and 6 lock vessels.*
- AGR Compressors – *Train B CO2 Recycle Compressor (CO-2066) gear box rebuild is complete; commissioning work continues.*
- Gasifier B plugging - *Gasifier B was shut down August 23, 2016 after bed circulation issues arose and hot spots were detected on reactor shell; ash removal and refractory*

*inspection were completed; minor refractory repairs and dry out were completed; preparing for pressure/leak testing and resumption of coal feed and syngas production.*

- *Gasifier A syngas production - Gasifier A continues operating at minimal capacity due to issues with the venturi nozzles and dryers 1 and 2; the coal feed rate has varied with an average of 100,000 lb's/hr and pressure between 120 and 180 psi, both well below design rates.*
- *Gasifier A CCAD and CFAD systems – issues with the CFAD system continue to be investigated while operating the system in manual; CCAD system designed for smaller particles – coal feed modifications resulted in larger particles, added fluidization inserts, the CCAD system operation has improved with the level of ash in the standpipe being maintained between 55 to 65 feet, but not tested at higher throughputs.*
- *Train 3 Cyclonic baghouse – deluge system malfunction resulted in dislodging of five of the bag filters and shutdown for ash removal and filter replacement; reportable incident occurred during ash removal.*
- *Gas Cleanup block valves – one valve (XV-14507) on Train A is being replaced due to shaft damage that has delayed catalyst sulfiding; remaining valves should be inspected for potential damage from over torquing.*
- *Coal flow meters – 4 of 12 failed due to cracked ceramic inserts; repairs, replacements, improvements, and alternate flow measurement being pursued.*
- *Nitrogen Plant – capacity is insufficient to support simultaneous startup of both gasifiers, requiring availability of recycle syngas on one train before starting the second train; additional flow valves are being installed to monitor the nitrogen usage in the plant.*

### **Contractor Hotline**

MPC has established a toll free telephone number for contractors or others to provide observations of any concerns with improper activities associated with the project. Comments are collected by a third party and reported to MPC for follow up investigation and action. The IM is copied on all correspondence and will report status of all cases. There were no new concerns filed this reporting period (September, 2016).

A summary of the twenty six (26) claims received to date and their status, including corrective actions taken, is included in Appendix I.

### **Project Document Status**

The overall status of the project document reviews are summarized in Appendix B to this monthly report. Most of the RFI's have been posted, reviewed and closed (19 open items remaining). Primary concerns noted by the engineering disciplines are summarized below:

- *Scope Additions – MPC has posted updated list through July, 2016 for approved items (\$127 Million) and through September 14, 2016 for pending items (21 items); weekly updates are being provided to the IM Site Team for all FCR's, OCR's and Resource Pool Listings.*
- *Process and Technology – MPC responses to five new RFI's were submitted in August with one of these remaining open (refer to Section 1.10 and Appendix B).*

- Operations and Maintenance – *final RAM Analysis Model was posted and has been reviewed; IM submitted 3 additional RFI's relative to the RAM Analysis in September.*

## Project Cost and Schedule

**In the August 2016 PSC Report, MPC reported a one month slip in forecast completion date to November 30, 2016, and an increase in forecast capped cost of \$33.2 million to \$5.461 billion, including a decrease in base contingency of \$7.6 million to \$26.2 million and a decrease in Schedule Risk of \$7.0 million to \$28 million. Forecast uncapped costs increased in August by \$29.1 million to \$1.426 billion due primarily to increased AFUDC costs.**

Total capped spending for the plant through August, 2016, with deduction for Department of Energy (DOE) funding, was \$5.308 billion. Overall plant EPC remained at 99% complete. Uncapped spending through August was \$1.341 billion. Refer to Appendix G for the PSC Report Summary.

As of September 25, 2016, the current working schedule indicates TOD of 10/30/16, which is a 354 day slip from the November 2014 rebaseline date, and a 19 day slip from the 8/28/16 report. With the shift from Gasifier 'B' to Gasifier 'A' due to a temperature excursion in Gasifier 'B' and slag formation in the Gasifier, the critical path to TOD is now through Gasifier 'B' ash removal, inspection, and repairs; Gasifier 'B' Coal Feed Tests; Reliable/Clean Syngas Gasifier 'B'; and Train 'A' and 'B' Syngas Operations.

Key drivers on secondary path include:

Reliable/Clean Syngas Production - Train 'A'

- WSA Readiness (10 days off the top path) - WSA catalyst preservation measures have been removed, and heating up to hot standby will take place sooner.

TOD

- Six dryers ready to support TOD (4 days off critical path), driven by full commissioning of all dryers. All dryers are scheduled to be complete by October 26.

Overall project execution status was reviewed on September 13, 2016 at the jobsite. Refer to Appendix D for detailed meeting notes. Primary concern is additional schedule slippage and associated cost increases, and unknown startup and technology risks.

- Additional schedule slippage – MPC has reported a delay in COD to November 30, 2016. MPC will continue to evaluate startup schedule and remaining risks, and has included \$28 million for schedule risk in the August cost forecast; however, recent trends in startup progress (1.1% per month over the last six months with 6% remaining) will have to improve to meet the forecasted COD. Schedule risks remain for completion of punchlists, scope additions, and on-going issues with the coal and ash handling systems have yet to be resolved. IM believes remaining process and mechanical risks in gas

cleanup are being under estimated, and completion of performance testing on CTA will be required to obtain full capacity that is scheduled post COD.

- Associated cost increases – While increases in the indirect project costs due to schedule delays are capped and therefore being absorbed by the MPC shareholders, the rate payers are also at risk for alternative power generation and AFUDC costs, to the extent these are allowed by the MPSC.
- Unknown startup and technology risks – key concerns include premature equipment failures, coal feed, ash removal, refractory reliability, gas cleanup, overall plant process control integration, chemical product quality and off taker performance. Issues associated with several of these concerns (equipment failures, coal feed, ash removal, refractory reliability), have already been reported and are still being addressed.

## Accounting

Topp McWhorter Harvey, PLLC (formerly known as Nicholson & Company, PLLC and hereinafter referred to as TMH) has completed the accounting audit of the special-purpose Historical Schedules of Capped and Uncapped Plant Costs of the Project for the historical project-to-date and month-to-date periods ended July 31, 2016, and the examination of special-purpose Forecasted Schedules for the period beginning August 1, 2016, through the completion of the Project.

On October 3, 2016, the Company filed their August 2016, monthly Form 8K with the SEC which increased its Capped Plant Cost Current View (forecast) for the Kemper IGCC Project to approximately \$5.461 billion, net of DOE grants and Cost Cap Exceptions. The Company's Monthly Status Report through August 2016, increased its Current View (forecast) of Total Exemptions and Exceptions (Non-Capped Cost) to approximately \$1.426 billion. The total Current View (forecast) for Capped Plant Cost and Total Exemptions and Exceptions (Non-Capped Cost) in the Company's Monthly Status Report through August 31, 2016, is \$6.886 billion.

In connection with the filing of the August Monthly Status Report, the Company evaluated the construction, commissioning, and start-up schedule for the Kemper IGCC as the result of ongoing start-up and commissioning activities for this first-of-a-kind technology. On September 13, 2016, gasifier "A" started syngas production and has operated at nearly 100% availability at varying levels of capacity. In late August, gasifier "B" was taken offline for inspection. The removal of ash and ash deposits prior to the inspection of gasifier "B" required more time than initially expected. Additional time has been added to the schedule to allow for the restart of gasifier "B" and for both gasifier trains to achieve the sustained capacity levels necessary for the initial operations and testing of the syngas clean-up systems and the production of electricity using syngas. The remaining schedule also reflects the time expected to complete the integration of all systems necessary for both combustion turbines to simultaneously generate electricity with syngas. As a result, the Company expects that the Kemper IGCC will be placed in service by November 30, 2016 and has revised its previous cost estimate, which included projected costs through October 31, 2016, to include projected additional schedule costs through November 30, 2016.

Accordingly, the August Monthly Status Report contains a further increase in the cost estimate subject to the cost cap for the Kemper IGCC of approximately \$33 million, including a further adjustment of approximately \$5 million for the month of August related to repairs and modifications to gasifier “B” and mechanical improvements to coal feed and ash management systems and approximately \$28 million related to the extension of the expected in-service date described above.

The next steps for the facility include the continued operation of gasifier “A” to support production of electricity using clean syngas, as well as the successful restart of gasifier “B” and the generation of electricity using syngas from gasifier “B”, all of which are scheduled to occur by the end of October. If these activities do not occur by the end of October, the expected in-service date and related cost estimate for the Kemper IGCC may require further revision. Further cost increases and/or extensions of the expected in-service date may result from factors including, but not limited to, difficulties integrating the systems required for sustained operations, major equipment failure, unforeseen engineering or design problems including any repairs and/or modifications to systems, and/or operational performance (including additional costs to satisfy any operational parameters ultimately adopted by the Commission). During the start-up and commissioning process, the Company is also identifying potential improvement projects that ultimately may be completed subsequent to placing the remainder of the Kemper IGCC in service. If completed, such improvement projects would be expected to enhance plant performance, safety and/or operations. The related potential costs have yet to be fully evaluated and may be subject to the \$2.88 billion cost cap. Any further changes in the estimated costs of the Kemper IGCC subject to the \$2.88 billion cost cap, net of the Initial DOE Grants and excluding the Cost Cap Exceptions, will be reflected in the Company’s statements of income and these changes could be material.

The Commission issued an order on August 17, 2016, titled “CREATION OF DISCOVERY DOCKET TO MANAGE ALL FILINGS RELATED TO THE PUDENCE OF THE KEMPER COUNTY INTERGRATED GASIFICATION COMBINED CYCLE GENERATING FACILITY” which established Docket Number 2016-AD-161. The Commission expects that this order, and the procedures established with it, will promote efficiency and will reduce the contentiousness of disputes related to future Kemper Project dockets.

On October 3, 2016, the Company filed its compliance filing providing initial disclosures as required by Docket Number 2016-AD-0161.

On June 9, 2016, Treetop Midstream Services, LLC; Greenleaf CO2 Solutions, LLC; Tenrgys, LLC; Tellus Energy, LLC; WCOA, LLC; and Tellus Operating Group, LLC filed a Complaint against the Southern Company, Southern Company Services, Inc., and Mississippi Power Company in the State Court of Gwinnett County, Georgia. The Plaintiffs allege that the Southern Company Defendants concealed and misrepresented the Start Date of the Kemper Project, and that Treetop relied upon those misrepresentations while building a roughly \$100 million pipeline and conducting other work necessary to take CO2 from the Kemper Project. The Plaintiffs assert claims of fraudulent misrepresentation, fraudulent concealment, and civil conspiracy with respect to the Southern Company Defendants, and breach of contract with respect to MPC. The Plaintiffs seek compensatory damages and punitive damages as well as costs and interest. On August 10, MPC, Southern Company, and Southern Company Services filed their Answers as

well as their (i) Motion to Dismiss for Lack of Personal Jurisdiction, (ii) Motion to Compel Arbitration, (iii) Motion to Dismiss for Forum Non Conveniens, and (iv) request for oral argument. A hearing is set for January 13, 2017, in Georgia. All of the above motions remain pending and the Southern Company Defendants will vigorously defend the matter, and the final outcome of this matter cannot now be determined.

As reported in the Form 10Q for the first quarter ended March 31, 2016, and again in the Form 10Q for the second quarter ended June 30, 2016, Mississippi Power Company disclosed that the Securities Exchange Commission (SEC) is conducting a formal investigation of Southern Company and Mississippi Power Company concerning the estimated costs and expected in-service date of the Kemper IGCC Project. Southern Company and Mississippi Power Company believe the investigation is focused primarily on periods subsequent to 2010 and on accounting matters, disclosure controls and procedures, and internal controls over financial reporting associated with the Kemper IGCC Project. As of the date of this report, October 6, 2016, Southern Company and Mississippi Power Company are still in the document production stage and continue to cooperate with the SEC. The ultimate outcome of this matter cannot be determined at this time; however, it is not expected to have a material impact on the financial statements of Mississippi Power Company.

## Discipline Summaries

### Environmental / Permitting

CCE has completed its review of additional environmental/permitting documentation provided by MPC since October 2015. The IM's review of these documents has not identified any major concerns or issues. However, there will be additional monitoring reports (Mitigation Action Plan, Wetlands Mitigation and Water Quality and Macroinvertebrate Monitoring Reports) prepared by MPC and LF for the MDEQ and the Corps of Engineers. These documents and reports should be provided to and reviewed by the IM to insure that the permit requirements for the IGCC Plant Site and Linear Facilities and for the Liberty Mine continue to be met.

IM is monitoring status of approvals for the two (2) remaining plant permits:

- Title IV Acid Rain Permit – **This permit was issued by MDEQ on 9/1/16.**
- Title V Operating Air Permit Modification – Application was submitted on 8/22/14; MDEQ issued draft permit.

### Process and Technology

Implementing site monitoring plan for gasifier startup by IM gasification technology specialist. Last site visit was conducted week of September 12 (see Section 1.10). Next visit will be conducted week of October 10. MPC responded to five new RFI's in August, one of which is still pending (refer to Section 1.10 and Appendix B). The following process and technology concerns are described in Section 1.10:

- The IM Team will continue to monitor the gasifier vibration behavior and the performance of the vibration reduction system.

- The long-term viability of the modified refractory system design in repaired areas and of the original refractory system design in remaining areas of both gasifiers.
- The root cause(s) of the temperature excursion event in Gasifier B need to be thoroughly investigated and mitigation actions should be developed and implemented to prevent a recurrence of such an event during subsequent startup and commissioning activities and long-term operations.
- It is unclear to the IM Team that the minor reductions in gasifier operating and alarm set point temperatures will significantly reduce the risks of thermal excursions or long-term clinker formation.
- It is still not possible to feed pulverized coal to either Gasifier reliably at even 50% of design feed rates for extended periods of time.
- Continuous, stable operation of the Airlocks/Rotary Valves upstream and immediately downstream of the Coal Dryers at full design rates must be achieved before concluding that full functionality of the Coal Preparation System has been successfully demonstrated.
- The current Fluidized Bed Dryer design does not have any provision for the discharge of non-fluidizable, high-density material during normal operation.
- The IM Team does not consider the reported mitigation plan to deal with the build-up of rock-like material in the Dryer beds as an effective mitigation strategy as it does not **prevent** the solids build-up issue and its negative potential impact on plant availability.
- Reliable Lock Vessel operation at full design coal feed rate and operating pressure must be demonstrated to ensure each Gasifier train can achieve reliable nameplate syngas production.
- Trouble-free operation of the Venturi Scrubbers is required to enable the coal feed system for either gasifier train to operate continuously at full design coal feed rate.

### Lignite Delivery Facility

LDF construction is 100% complete. 200 tons of coal are being maintained in the Crushed Coal Silos 1 and 2 to supply coal to dryers 1 and 2. The 300 tons of coal in Crushed Coal Silo 4 that was left in the silo during the Feed Conveyor belt replacement was not deinventoried. Approximately 10,000 tons of coal is being maintained in the dome to support lignite testing. Mobile coal screening equipment continues to screen the coal at the coal storage pile before it is sent to the truck dump. On Monday (9/19) and for the next 10 days trucks will be hauling off the waste coal mixture that had been piled up and stored in the LDF area over the last month. This material is being trucked off site for disposal because the Ash Pond or GAMU (Gasification Ash Management Unit) is not permitted to accept a waste coal mixture containing rocks and other debris. Additional waste coal mixture has been hauled to the LDF the last two weeks of September for dewatering before being trucked off site. A large amount of sludge (9') has accumulated in the LDF sump which is being sucked out by Hydrovac with over 20 loads a day being removed. This material is being dumped in modular tanks 1 through 6 in area 900.

### Procurement

IM reviews of Procurement Activities are complete. Most known key Contracts and Purchase Orders, including construction and Liberty Mine facilities, have been included, totaling about 700 items (excluding O&M Service Contracts, MS Tier II contractors, and Transmission). Refer to the IM July 2016 Monthly Report (Appendix F), for the final update of completed reviews.

## Site Activities (Plant metrics through September 25, 2016)

The following activities are **behind schedule** with the percentage behind included - Equipment Insulation (2), Pipe Insulation (1), and Startup (6%).

Mechanical work has been proceeding in the following areas - Area 210 - Waste Water & Selexol Storage Area, Area 140 – Tankage Area, Area 150A/250A - Coal Prep Area, Area 120/220 – Gas Cleanup, Area 150/250 - Gasifier Area, Area 160 – Wet Sulfuric Acid Area, Area 230 – Selexol Area (North), Area 130 – Selexol Area (South), Area 105 – Train 1 Gas Clean Up Area, Area 110 – Compressor Area, Area 180 – CO<sub>2</sub> Compression and Dehydration Area, and Area 260 – Sulfuric Acid Recovery Area.

Electrical & Instrumentation work has been proceeding in the following areas - Area 105 – Train 1 Gas Clean Up Area, Area 110 – Compressor Area, Area 120/220 - Gas Cleanup Area, Area 130/ 230 – Selexol Area (South & North), Area 140 – Tankage Area, Area 150/250 - Gasifier 1 & 2, Area 150A/250B – Coal Feed 1 & 2, Area 160 – Wet Sulfuric Acid Area, Area 170 – Pipe rack, Area 180 – CO<sub>2</sub> Compression/Dehydration Area, Area 200 - Main Electrical Building, Area 210 - Waste Water Treatment Area, and Area 260 – Sulfuric Acid Recovery Area.

**Gas Clean - Up (Areas 105, 120, and 220)** – Crews are finalizing the air freeing process by pressuring up, heating, and preparing to start circulating nitrogen through train 1 Gas Clean Up. The nitrogen temperature flowing over the COS Hydrolysis catalyst needs to be a minimum of 285 degrees before syngas can be sent through the system. As of Thursday morning (9/22) the temperature was at 220 degrees with the minimum temperature of 285 degrees expected to be reached by Friday (9/23). It was decided that a reduced feed rate of 100,000 lb's/hr instead of the planned 200,000 + lb's/hr will be used for sulfiding the catalyst in the Water Shift Reactors. MOC's will be completed before the sulfiding begins which is scheduled for the first week of October. This reduced feed rate will extend the sulfiding process from the planned 3 or 4 days to possibly 5 or 6 days. In train 2 Gas Clean Up a nitrogen cap is being maintained.

**Process Air (Area 110)** – Filtering continues this month on the Process Air Compressors 2 lube oil system to remove condensation in the oil using a dehydration unit. Final alignment and piping restoration was completed on train A Recycle Gas Compressor (CO-1008) with a coupled run on Tuesday (9/13). This coupled run was successful with vibration results just under vendor specs while operating at temperature. The vendor was contacted and arrived on site to assist startup in determining if this vibration was coming from pipe stress as the nitrogen heats up during the compressor run. The vendor was able to eliminate the vibration issues by repositioning and installing larger vibration probes. The compressor was successfully run Thursday (9/22) with the vendor confirming that the Recycle Gas Compressor (CO-1008) is ready for service. Process Air Compressors 1 and 2 have been running to support Gasifier A.

**Selexol (Areas 130 and 230)** – The catalyst rinse in the Syngas Scrubber (CL-2007) was completed followed by seal repair on Syngas Scrubber pumps PU-2007A and B and new isolation valves installed on Wednesday (8/31). Train B Syngas Scrubber (CL-2007) was opened for inspection and cleaning in the bottom of the vessel on Thursday (9/8).

The inspection was completed and the manway doors closed on Wednesday (9/14). Repair and recommissioning work on the AGR compressors began early this month on train A while circulation continued on both the lean and semi-lean solvent loops and Solvent Filtration Systems (FL-1060 and FL-2060 Cricket Filters) in trains A and B. Both units were brought down on Monday (9/19) for maintenance and testing. Commissioning train A Flash Gas Compressor (CO-1065) was completed Saturday (9/24) with only minor tuning remaining. Train A was returned to service on Monday (9/26) with operations verifying valve alignment and starting circulation in both Semi- Lean and Lean loops in preparation for Sulfiding the Water Gas Shift catalyst and introducing syngas to the AGR. Lube oil flushing was completed on train A CO<sub>2</sub> Recycle Compressor (CO-1066) with the compressor being run all day Tuesday (9/27) and Wednesday (9/28). 230 Area, work continues on train B CO<sub>2</sub> Recycle Compressor (CO-2066) while lube oil flushing continues on train B Flash Gas Compressor (CO-2065). Commissioning dates for both train B compressors has not been scheduled.

**Tankage Area (Area 140)** – The Anhydrous Ammonia Rerun Pumps (PU-54A and B) that were sent out for seal replacement were received and reinstalled on Friday (9/2). Anhydrous Ammonia Reflux Makeup Pump PU-59A that was sent out for seal replacement was received and reinstalled Thursday (9/22). The insulators have started insulating the piping around the Anhydrous Ammonia Reflux Makeup Pumps PU-59A and B this month.

**Gasifier (Areas 150 and 250)** – The following activities are in progress or complete:

- **Gasifier B** – Gasifier B was shut down the end of August after bed circulation issues arose. Deinventorying all the ash and clinkers was completed in the Presalter downcomer and Seal Leg with scaffolding being installed in the Seal Leg for inspection on Wednesday (9/21). The J-Pipe was vacuumed out completely on Thursday (9/22) with startup verifying and inspecting by bore scoping the J-Pipe. Crews were able to remove the fused ash and remaining clinkers at the bottom of the Riser with discussions Wednesday (9/21) with startup and operations on where and how much refractory repair will need to be completed. Missing pieces of hard face refractory around the bull nose at the top and sides of the J-Leg in the Standpipe was noted. Some minor refractory issues requiring minor repairs were noted in the Riser around the bull nose of the J-Leg. Scaffolding was installed in the Standpipe to the top of the J-Leg and in the Riser from the bottom to the top for inspection. Scaffolding and inspecting the Riser over the weekend (9/24 and 25) was completed with only minor repairs needed to the refractory following the removal of ash and visual inspections of the refractory in the days since the gasifier's initial run. The 53 hour dry out, using heating blankets, at the bull nose section of the J-Leg in the Standpipe began Tuesday (9/27) at 3 pm and completed Thursday night (9/29). Minor repairs in the Presalter were completed Tuesday night (9/27) and required only air drying. Preparing for coal feed and syngas production continues.
- **Gasifier A** – A 300 psi pressure test on the CCAD and CFAD system was completed along with the 650 psi pressure test Monday (8/29). Fluidization controls and pressure transmitter purges were tested and set up. Solids flow isolation valves were stroked with only a few issues that have been addressed. PCD back pulse system was set up for operation, as was the PCD preheat system using the Syngas Coolers. Bed Ash from

Gasifier "B" was loaded into the Gasifier with a level established Wednesday (8/31) followed by circulation at 4 pm and lighting the Start-up Burners at 7 pm. Refractory cure out was successfully completed with the final 24 hour hold completed early Tuesday morning (9/6). Circulation continued with an outlet temperature of 1600 degrees while monitoring the fluidization controls and pressure during circulation. Coal feed began with the coal feed rate varying with a high of 100,000 lb's/hr and an average of 55,000 lb's/hr and a pressure of 120 to 180 psi. This month Gasifier A continued to maintain a temperature of 1750 degrees while operating at minimal capacity due to issues with the Venturi nozzles and dryers 1 and 2. Pressures and feed rates were increased enough to begin sending syngas downstream Tuesday (9/27) until issues in the Gas Clean-Up were discovered.

- Train A and B Lock Vessels (Feeders) – All piping and logic modifications have been completed on trains A and B. All the slide gate valves were received and reinstalled.
- Train A Lock Vessels (Feeders) – Feeders 2A and 2B have been supporting coal feed into Gasifier A Wednesday (9/21) when coal feed was swapped over to feeders 1A and 1B to remove a blind in one of the Multiclone bottom hoppers in train 2. All four feeders 1A, 1B, 2A, and 2B were available early Wednesday night (9/21) until train 2 Feed Conveyor plugged. Coal is now being supplied to Gasifier A using feeders 1A and 1B. Train 3 feeders are not available due to Baghouse 3 being deinventoried.
- Train 3 Cyclonic Baghouse – Deinventoring wet coal and downstream equipment continues after a mis-operation of the deluge water system. Five of the filter bags from the top section of the baghouse were washed away when the deluge system activated. One lodged in the lower Rotary Air Lock under the baghouse. Train 3 will not be available to supply coal to Gasifier A until all the coal has been removed from the baghouse. Due to a safety incident Wednesday night (9/21) work was stopped and resumed Thursday morning (9/22) with cleanup operations underway. Crews have installed blinds at the bottom of the baghouse lower hoppers.
- All 3 Pulverizer for Train B Gasifier have been cleaned, inspected, and closed.
- Train B PCD's – Trains A and B PCD's – The cracked weld on the conduit that had failed allowing particulates to flow into the top of the PCD was repaired. The top dollar plates were put back on and bolted up and torqued. It was also noted that particulates were found in the bottom of train A Syngas Scrubber (CL-1007). The 90 degree elbows will be reinstalled once the clearance has been released on Gasifier B.
- Gasifier A CCAD and CFAD systems – On Monday (9/5) a 5" cut in the line at the bottom of the CFAD between the 1<sup>st</sup> and 2<sup>nd</sup> PLD was discovered. This cut looks to have been intentional with repairs completed early Tuesday morning (9/6). Issues with the CFAD system have improved with operations still operating the system in manual. The CCAD system is working with the level in the Standpipe averaging 55 to 65 feet. Operations will continue to investigate the issues with the CFAD system.
- All the test breaks for the concrete that was placed over the repaired Firewater system leak on the south side of the Gasifier were completed with traffic being routed over the

repaired area Thursday (9/22). Crews have installed and completed the safety bollards around the fire water stations.

- The new personnel and freight elevator are still not in operation.

**Area 150A/250A - Coal Prep Area:** The following activities are in progress or complete:

- Train 6 – Fluid Bed Dryer vacuuming and cleaning was completed Wednesday night (8/31). Rock material was found mainly along the sides of the dryer to the outlet with some of the material having to be broken up was removed. The shaft bearing on the Roll Crusher was replaced with new sealed bearing Thursday (9/8) with modifications and tuning continuing.
- Train 5 - Fluid Bed Dryer vacuuming and cleaning began early Thursday morning (9/1). Rock material throughout the dryer bed to the outlet was visible with some of the material having to be broken up was removed. The shaft bearing on the Roll Crusher was replaced with new sealed bearing Friday (9/9) and crews continue modifications and tuning.
- Train B Dryers – Dryer train 4 is being prepped for deinventorying. The dryer system was not deinventoried after the Feed Conveyor belt was replaced in early September. After the system has been deinventoryed, cleaned, and inspected crews will prep the system to begin lignite test runs and PDAC testing again.
- Train A Dryers – Train 2 has been supplying coal this month for Gasifier A. Train 1 was brought on line Wednesday (9/21) while train 2 was down to remove a blind in the bottom of the Multiclone Bottom hopper and to remove plugging in the Feed Conveyor. The dryer was up and running on Thursday (9/22). Train 3 is down due to the coal being deinventoryed in Baghouse 3 this week.
- All Ash Silo bottom pneumatic valves were received and reinstalled.
- Train 1 Venturi Scrubbers – Plugging in all 4 Venturi Scrubbers resulted in all 4 scrubbers having to be vacuumed out and coal clean up in the alleyway and the south sump. The cause of the problem was blinds that were inadvertently left in the bottom of all 4 Multiclone bottom hoppers. The blinds were preventing the hoppers from discharging the coal fines into the Multiclone Collection Conveyor. All the fines were being carried over to the Venturi Scrubbers. After inspecting trains 2 and 3 it was discovered that a blind was left in 1 of the 4 Multiclone bottom hoppers on train 2 also. These blinds were removed.
- Housekeeping – Housekeeping is being addressed due to a couple of flash fires late this month. Ground floors and in the structure operators are hosing down areas where coal has accumulated. The area around trains 1 and 2 Venturi Scrubbers where several spills occurred were cleaned. Crews are removing the rocks from around the scrubbers and replacing them with new rocks. Small dikes will be built up around these areas to prevent future spills from migrating to other areas.

- Venturi Scrubber duplex strainers platform and support steel form work and rebar installation is underway.
- Gasifier Work Control Center (150A) – Crews are installing card reading devices in front of the work center.
- LP Vent Gas Compressor (CO-00040) – This compressor was sent out for repairs in August was received Wednesday (9/7) and reinstalled with the alignment and piping restoration completed on Wednesday (9/14). Crews completed torquing the bolts on Friday (9/16) with lube oil flushing underway. Commissioning will begin after all flushing activities are complete.

**Ash Removal System (Area 150A/250A)** – The following activities are in progress or complete:

- The pneumatic slide gate valve above Ash Moisturizer B was reinstalled. Coal and ash removal through the A and B Ash Moisturizers continue without any mechanical issues noted. Dust suppression still is an issue at times during ash and coal loading for disposal.

**Wet Acid (Area 160)** – At the beginning of the month the catalyst reactors were still laid up with a mixture of nitrogen and dehumidified air, standing by for upcoming operations as part of syngas production. Circulation inside the Quench and Scrubber Columns resumed after the 24" lined tee was leak checked on Friday (8/26). The Air Heater HX-0075A that was removed, dried, and scheduled to be reinstalled Tuesday (9/20) will not be installed until another vendor representative is scheduled in to reinstall the heater. A steam leak at the manway of the Steam Drum was repaired Monday (9/26) by repairing the strong backs on the door and replacing the manway gasket. On Tuesday (9/27) the WSA was prepared for operation by pulling the catalyst preservation measures, doing another Condenser acid spray, dropping clearances and executing the valve alignment for operations. The unit is now in pre-warm up in preparation of firing the Combustor to "Hot Stand-by" ahead of Sulfiding the Water-Gas-Shift catalyst and introducing syngas to the AGR. Both temporary package boilers continue to operate at 60% and supplying 325# steam to the plant while a leak on the Auxiliary Boiler is being addressed.

**Pipe Rack & BOP (Area 170)** – Construction is complete.

**CO<sub>2</sub> Compression / Dehydration (Areas 180 and 260)** – Leak testing on the "B" CO<sub>2</sub> Product Compressor will continue this month as clearances, material and manpower allow. Operation is waiting on a larger vaporizer scheduled to arrive on Thursday (9/8) to continue testing on the compressor. On Monday (9/19) crews began the process of moving testing efforts over to train A CO<sub>2</sub> Product Compressor (CO-1080) as part of preparing train A for CO<sub>2</sub> removal. Parts and hoses have been ordered while the vaporizer and CO<sub>2</sub> skid is being moved and set up in train A in preparation to begin leak testing the system on Friday (9/23). Train B CO<sub>2</sub> Product Compressor (CO-2080) leak testing and commissioning will resume after train A is complete. After all testing is complete the compressor will be run for commissioning. (CO<sub>2</sub> will be run through the compressor and discharged into the underground CO<sub>2</sub> line up to the plants boundary

limit). 8 of 8 refrigeration compressors have been run in and tuned. One of the compressors is in service supporting solvent circulation on train A AGR.

**Flare (Area 190)** – Modifications and pipe fabrication will continue as resources are available to the Ultrasonic Flow Systems for the LP Acid Gas & Ammonia Flares. Trains A and B HP, LP Acid Gas, and the Ammonia Flares are all operational.

**Waste Water Treatment (Area 210)** – The carbon removal and replacement on Carbon Bed Filter B was completed Wednesday afternoon (8/31). A 48 hour outage to install pressure controllers on the overhead piping between the Wastewater Ammonia Stripper (CL-0044) and Wastewater Ammonia Purifier (CL-0052) while condensate water is being stored in the Wastewater Tank (TK-042) from train A Syngas Scrubber (CL-1007) for processing. This piping modification is to correct the flashing that has been occurring at the Ammonia Stripper Reflux pumps (PU-45A and 45B). Modifications and maintenance were completed and the H<sub>2</sub>S Stripper column is in service processing sour water produced by train A Gasifier/ Syngas Scrubber operations. The water level in the Wastewater Tank (TK-042) continues to drop as processing water and discharging to the Reclaim Sump continues. Crews have removed the Wastewater Ammonia Stripper Reflux Pump PU-45A for seal replacement on Thursday (9/22). Crews are insulating the piping on the Ash Moisturizer Booster Pump PU-6102A.

**Acid Storage Tanks and Off Spec Acid Tank (Area 260)** – No activity was observed.

**Nitrogen Plant (Area 260)** – Additional nitrogen flow valves have been received and are being installed as part of monitoring the nitrogen usage in the plant. The plant continues to supply nitrogen with no issues.

**Combined Cycle HRSG's and CT's (Areas 510, 520, 530, and 540)** – The outage for CTA (Combustion Turbine A) to install the wiring harness from CTB began at midnight on September 15 for 4 days. The outage was completed with the unit coming on line at 8 pm Monday night (9/19). The unit was turned over for dispatching with CTA coming up on natural gas.

**Steam Turbine & Auxiliary Boiler Area (Area 550)** – Construction is complete.

**Water Treatment (Area 570)** – Construction is complete.

**Cooling Towers (Areas 580 and 590)** – Construction is complete.

**Main Gate Security (Area 700)** – Construction is complete.

**Sewer Plant and Ash Storage Pond (Area 800)** – Crews began dumping the material that is being sucked out of the LDF sump last Friday (9/23) into modular tanks 1 through 6 west of the Gasifier Cooling Tower with 4 of the 6 modular tanks filled as of this morning (9/29). Modular tanks 7 and 8 are maintaining 500,000 gallons/each of demin using water from the plants Condensate Tank to supply the two temporary package boilers this week. Water is available to be processed from the north pond if needed.

**Process Water Reservoir (Area 900)** – The ramp and drain piping for the temporary truck wash on the northeast corner of the GAMU (Gasification Ash Management Unit) was completed on Friday (9/2) with the temporary truck wash in operation. Crews have added an additional slab on the outside of the drive through area to help the water run off to the drainage area. The forms were built and the rebar installation was completed and the concrete was placed. Crews are using the Water truck to wash out the haul truck dump body before leaving the ash pond area. The temporary pressure washer for the haul trucks is set up at the wash pad.

### Safety

**Project Safety Summary:** Since the beginning of the project, there has been 84 reportable incidents at the site with 40,053,752 man hours worked. This year, the site has worked 30,120,095 man hours with 2 reportable incidents. The project RIR stands at 0.13 for the year and 0.42 for the Project Total to Date.

### Schedule

The construction schedules for remaining base scope, and the schedule for scope additions, all as of 9/25/16, are included in Appendix E.

Key construction metrics reported through 9/25/16 are summarized below:

- Equipment insulation installation was 2% behind schedule overall. Remaining work in the Gasifier area is scheduled to complete in October. Remaining work in Gas Cleanup consists exclusively of metal guards. This work is delayed pending receipt of material on site. The remainder of the material is expected to arrive on site in October. Planned quantities will be reforecast accordingly.
- Pipe insulation installation was 1% behind schedule overall. Work in the Gas Cleanup area is complete. The remaining quantity is in the Gasifier area. Insulation of the PCD systems will be completed in October, and the remaining work will resume as startup activities allow.
- Construction to Startup punchlist items for base scope (excluding scope additions) last reported at 136 on August 28 are essentially complete and will no longer be reported.
- Overall, turnover packages from construction to startup are 100% complete as 968 are received out of a total of 968.

### **Startup**

- At the end of August, total startup employee staffing was at 238, including 22 SCS startup employees, 210 supplemental, and 6 OPCO's staff; plus 328 startup supplemental craft support and 46 I&C field technicians (grand total of 612 – a decrease of 72 from end of July).
- Through September 25, startup progress was 94.0% complete overall (1.0% increase from August 28) vs. planned 100%.

- 959 TOP's have been commissioned out of a total of 968 (99% complete). Of the 9 remaining, 3 are complete for commissioning with the exception of completing all I/O loop checks. 41% (399 of 968) have been turned over from startup to operations (mostly CC and associated BOP).
- Startup test packages are 84% complete (81 of 96 complete). Of the remaining 15 test packages, 12 are currently in progress.
- Overall, I/O checks are 1% behind plan (99% complete, 229 of 31,901 remaining). New scope accounts for approximately 223 points of the remaining 229 points that require testing. Scope additions will potentially continue to change the total point count over the coming weeks as loops are added or deleted. These changes will be incorporated into the plan. The majority of the remaining loops are not available to be checked due to needed design, construction, or release from clearance. There is no impact to test package execution or milestone completion.
- Startup to Operations punchlist summary for base scope (excluding scope additions) shows a decrease in remaining open items from 6,673 on August 28 to 4,930 on September 25 (only 3 of these are high priority).
- MPC reported the following startup achievements in September:
  - Gasifier 'A' refractory cure completed on September 6.
  - Lignite Dryer 1 and 2 commissioned.
  - Gasifier 'A' first syngas production achieved September 13.
  - Gasifier 'A' achieved operation up to 200,000 lbs/hour on lignite (380 hours / 16 days of production through 9/28/16).
  - AGR 'A' PSSR signoff completed.

## Operations and Maintenance

Overall 278 of the planned 309 permanent employees are on staff (333 of 309 including contractors). Current supplemental contract staff will be considered for remaining 31 permanent positions.

Process Safety Management (PSM) program development:

- There are 14 PSM elements – 12 of the 14 are complete (ready for chemicals).
  - Executing PSM consultants' recommendations for the remaining 2 elements - Process Hazard Analyses and Pre Startup Safety Review.
1. Process Hazard Analysis - all eight PHA's requiring updates are complete, working through last few remaining recommendations (>99% complete).
  2. Pre-Startup Safety Reviews - Initial Equipment Walkdowns using PSSR checklist are complete for all required systems (346 TOPs walked down out of 346, 100%

complete). 13 of 15 PSSR's are complete, last 2 for AGR B and HRSG Ammonia are scheduled for October (0 priority PSSR Action Items remaining).

## Land

### **IM Review of Documents and Purchases from the Kemper County Courthouse, Lauderdale County Courthouse and Update on the Lawsuit Concerning the Kemper IGCC Power Plant Site and Liberty Mine, Kemper County, Mississippi**

In the August 2016 report, the IM reported on three new purchases of mining land during the month in Kemper County, MS., one new land purchase in Lauderdale County, MS., discussed a review of land documents covering prior land purchases and developments in the Kemper County lawsuit.

In this September 2016 report the IM will discuss information received from Mississippi Power Company (MPC) in reply to Requests For Information, land records searches for new purchases of land in Kemper and Lauderdale Counties in Mississippi, the redemption from tax sales of land purchased by MPC in Lauderdale County and developments in the Kemper County lawsuit.

The IM has reviewed the above described updated information and determined the following:

- MPC made no new purchases of coal mining land in Kemper County, MS. in the last month.
- There were two new purchases by MPC of coal mining land in Lauderdale County, MS. last month of 40.83 net acres interest in 49.0 surface acres, more or less.
- MPC redeemed thirteen parcels of land owned by MPC from a Lauderdale County tax sale held on August 29, 2016 for the 2015 property taxes.
- The IM is reviewing documents provided by MPC regarding prior purchases of coal mining land and will report on the purchases in the next few months.
- The parties to the Barham versus Mississippi Power Company lawsuit are still waiting for a decision from the Judge regarding the Summary Judgment Motions filed by both parties and argued at a court hearing held August 27, 2015 in the Chancery Court in Philadelphia, MS. The last filing in the case was August 15, 2015.